

ABSTRACT

A cracking tube includes a lining of a fouling resistant and corrosion resistant iron aluminide alloy. The iron aluminide alloy can include 14-32 wt. % Al, at least 2 vol. % transition metal oxides, 0.003 to 0.020 wt. % B, 0.2 to 2.0 wt. % Mo, 0.05 to 1.0 wt. % Zr, 0.2 to 2.0 wt. % Ti, 0.10 to 1.0 wt. % La, 0.05 to 0.2 wt. % C, balance Fe, and optionally ≤ 1 wt. % Cr, and the coefficient of thermal expansion of the iron aluminide alloy is substantially the same as the coefficient of thermal expansion over the temperature range of ambient to about 1200°C of an outer metal layer. A cracking tube utilizing the iron aluminide alloy can be formed from powders of the iron aluminide alloy by consolidation methods including cold isostatic pressing (CIP), hot isostatic pressing (HIP), reaction synthesis, spraying techniques, or co-extrusion with a second material of the cracking tube.

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